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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,334	07/09/2003	Jonathan H. Fischer	0002245.0027	1363

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EXAMINER	
VAN ROY, TOD THOMAS	
ART UNIT	PAPER NUMBER
2828	
MAIL DATE	DELIVERY MODE
05/24/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/616,334	FISCHER ET AL.	
	Examiner	Art Unit	
	Tod T. Van Roy	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02/23/2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32 and 38-41* is/are pending in the application.

4a) Of the above claim(s) *14-18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-8,11,13,19,22,25,26,28-30,38,40 and 41* is/are rejected.

7)☒ Claim(s) *3-4,9-10,12,20-21,23-24,27,31-32,39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments, see Remarks, filed 02/23/2007, with respect to the rejection(s) of claim(s) 1, 19, 22, and 38 under USC 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found prior art.

The examiner agrees with the applicant that the stated arithmetic mean limitation found in claims 1, 22, and 38 is not met by the Robinson reference, and that modification of Robinson without an additional motivation providing reference is not proper.

Please see below for an updated rejection to the claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 5, 7-8, 11, 13, 19, 22, 25, 29-30, 38, and 40-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Carrick (US 6993459).

The following set of rejections is based on the interpretation that the optical midpoint power level is the power level obtained when the corrective control signal is applied to the laser for extinction ratio adjustment. The Examiner notes that the optical midpoint power level has not been defined in the claims, leaving the interpretation open to a broad degree.

With respect to claim 1, Carrick discloses an integrated circuit couplable to a semiconductor laser (fig.3 #12) and to a photodetector (fig.3 #24), the photodetector optically couplable to the semiconductor laser, the semiconductor laser capable of transmitting an optical signal in response to a modulation current (fig.1, 2, from fig.3 #6), and the photodetector capable of converting the optical signal into a photodetector current (inherent), the integrated circuit comprising: a modulator couplable to the semiconductor laser (fig.3 #6), the modulator capable of providing the modulation current to the semiconductor laser, the modulation current corresponding the an input data signal (fig.1); and an optical midpoint controller couplable to the photodetector and couplable to the semiconductor laser (fig.3 #32), the optical midpoint controller, in response to the photodetector current, capable of adjusting a forward bias current of the semiconductor laser (fig.3 Ibias output from #6, col.3 lines 52-55), so that the semiconductor laser generates the optical signal with a power level approximate to a predetermined optical midpoint power level (col.4 lines 40-45), said predetermined optical midpoint power level determined by calculating an arithmetic mean of a plurality of optical power levels (col.3 lines 15-50).

With respect to claim 2, *Carrick* discloses the modulator to be capable of providing a first modulation current level (fig.2 one) to the semiconductor laser when the input data signal has a first logical state (1) and providing a second modulation current level (fig.2 zero) to the semiconductor laser when the input data signal has a second logical state, the first modulation current level being greater than the second modulation current level; wherein the semiconductor laser is capable of providing the optical signal having a first optical power level in response to the first modulation current level and having a second optical power level in response to the second modulation current level (output to the optical network in fig.3), the first optical power level being greater than the second optical power level; and wherein the photodetector is further capable of generating a first photodetector current level in response to the first optical power level and a second photodetector current level in response to the second optical power level (input to fig.3 #26).

With respect to claim 5, the optical midpoint controller is capable of sampling the first photodetector current level to form a first photodetector current indicator, sampling the second photodetector current level to form a second photodetector current indicator, determining a measured optical midpoint power level as an arithmetic mean of the first photodetector current indicator and the second photodetector current indicator (please see claim 1), determining a variance between the measured optical midpoint power level and the predetermined power level (col.4 lines 40-45) and, based on the variance, forming an optical midpoint error signal (control signal, col.4 lines 13-50).

With respect to claims 7-8, *Carrick* discloses the optical midpoint controller is enabled to sample the first photodetector current level when the input data signal has a predetermine number of consecutive bits (or time) having the first logical state and is enabled to sample the second photodetector current level when the input data signal has a predetermined number of consecutive bits (or time) having the second logical state (shown in col.3 A1/A2).

With respect to claim 11, *Carrick* discloses the optical midpoint controller is further capable of providing, in response to the optical midpoint error signal, a forward bias current adjustment signal (from fig.3 #6, to correct for extinction ratio error) to a variable current source (inherent for the modulation), and wherein, in response to the forward bias current adjustment signal, the variable current source is capable of adjusting the forward bias current of the semiconductor laser to generate the optical signal having a substantially constant, predetermined optical midpoint power level (done to adjust to the extinction ratio predetermined average power value).

With respect to claim 13, *Carrick* discloses the optical midpoint power controller as outlined in the rejection to claim 5, and further teaches a sampler coupled to the photodetector (fig.3 #30/32), the sampler capable of sampling the first photodetector current level to form a first photodetector current indicator (samples and converts to a digital indicator) and sampling the second photodetector current level to form a second photodetector current indicator (samples and converts to a digital indicator).

With respect to claim 19, *Carrick* discloses an extinction ratio controller outlined in the rejection to claim 1, and found in col.4 lines 13-51.

With respect to claim 22, *Carrick* discloses a method of controlling midpoint power level of a semiconductor laser comprising: modulating the semiconductor laser at a first modulation level when the input data signal has a first logical state and modulating the semiconductor laser at a second modulation level when the input data signal has a second logical state (see rejection to claim 2); transmitting an optical signal having a first optical power level in response to the first modulation level and having a second optical power level in response to the second modulation level, the first power level being greater than the second optical power level (see rejection to claim 2); detecting the first mean optical power level and the second mean optical power level (see rejection to claims 1&2); determining a measured optical midpoint power level (see rejection to claim 5); determining an optical midpoint error as a variance between the measured optical midpoint power level and a predetermined optical midpoint power level (see rejection to claim 5) and; using the optical midpoint error, adjusting the forward bias current of the semiconductor laser to generate the optical signal having substantially the predetermined optical midpoint power level (see rejection to claim 5).

Claim 25 is rejected for the same reasons outlined in the rejection to claim 2 above.

Claim 28 is rejected for the same reasons outlined in the rejection to claim 5 above.

Claims 29-30 are rejected for the same reasons outlined in the rejections to claims 7-8 above.

With respect to claim 38, *Carrick* discloses a semiconductor laser capable of transmitting an optical signal having a first power level in response to a first modulation current level, and having a second optical power level in response to a second modulation current level, the first optical power level being greater than the second optical power level (see rejection to claim 2); a modulator coupled to the semiconductor laser, the modulator capable of providing the first modulation current level to the semiconductor laser when the input data signal has a first logical state and providing the second modulation current level to the semiconductor laser when the input data signal has a second logical state, the first modulation current level being greater than the second modulation current level (see rejection to claim 2); a photodetector optically coupled to the semiconductor laser, the photodetector capable of generating a first photodetector current level in response to the first optical power level and a second photodetector current level in response to the second optical power level (see rejection to claim 2); a sampler coupled to the photodetector, the sampler capable of sampling the first photodetector current level to form a first photodetector current indicator and sampling the second photodetector current level to form a second photodetector current indicator (see rejection to claim 13); a forward bias current controller coupled to the sampler and to the semiconductor laser, the forward bias current controller capable of determining a measured optical midpoint power level as an arithmetic mean (see claim 1); determining a first variance between the measured optical midpoint power level and a predetermined optical midpoint power level, and, based on the first variance, forming an optical midpoint error signal; and in response to the optical midpoint error signal,

further capable of adjusting the forward bias current of the semiconductor laser to generate the optical signal having substantially the predetermined optical midpoint power level (see rejection to claim 5); and a modulation current controller coupled to the sampler and to the modulator, the modulation current controller capable of determining a measured extinction ratio as a ratio of the first photodetector current indicator to the second photodetector current indicator; determining a second variance between the measured extinction ratio and a predetermined extinction ratio and, based on the second variance, forming an extinction ratio error signal, further capable of adjusting the modulation current provided by the modulator to the semiconductor laser to generate the optical signal having substantially the predetermined extinction ratio (see rejection to claim 19)

With respect to claims 40-41, *Carrick* teaches the integrated circuit including the optical midpoint control using arithmetic mean as outlined in the rejection to claim 1 above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 6 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrick in view of Robinson.

With respect to claims 6 and 26, *Carrick* teaches the integrated circuit and method outlined in the rejection of claims 5 and 25 above, but does not teach the photodetector current levels to be sampled via the respective voltages. *Robinson* teaches an additional photodetector (fig.1 #274) whose signals are evaluated via the corresponding voltages (col.8 lines 21-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the current referenced photodetector signals with the voltage referenced secondary photodetector signals as a matter of engineering design choice.

Allowable Subject Matter

Claims 3-4, 9-10, 12, 20-21, 23-24, 27, 31-32 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 9-10, 20, 23-24, and 31 are believed to be allowable as each of the either midpoint power controller or extinction ratio controller is stated as integrating the error signals with previous error signals to form an integrated error signal, and then adjusting the appropriate current response based on this integrated error signal, which was not found to be taught in the prior art. The prior art was found to teach generation of individual error signals, and to make adjustments based on each signal, rather than integrating a plurality of error signals together before adjusting the current levels.

Claims 3, 12, 21, 27, 32, and 39 are believed to be allowable as each of the either midpoint power controller or extinction ratio controller is stated as sampling a plurality of first and second photodetector current indicators, finding the mean of each of the plurality of first and second indicators, and then determining an overall mean of these two means to produce an optical midpoint power level or extinction ratio, which was not found to be taught in the prior art. The prior art was found to teach determining the averages of a 1^{st} and a 2^{nd} value, or an overall average value, but was not found to compute individual means for a plurality of 1^{st} and 2^{nd} values before producing the final averaged value.

Claim 4 is allowable as it depends directly from allowable claim 3.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TVR